

**WHAT IS CLAIMED IS:**

1. A rotary concrete mixing drum comprising:  
an interior surface at least partially provided by a polymer impregnated with  
a slip agent.

2. The drum of Claim 1 wherein the polymeric includes polyurethane.

3. The drum of Claim 1 wherein the slip agent has a surface energy less than  
the surface tension of a Portland Cement low slump concrete.

4. The drum of Claim 1 wherein the slip agent has a surface energy of less  
about 20 dynes per centimeter.

5. The drum of Claim 1 wherein the slip agent is a polydecene.

6. The drum of Claim 1 wherein the slip agent is a polyalpha olefin fluid.

7. The drum of Claim 1 wherein the slip agent is polytetraflourethylene.

8. The drum of Claim 1 wherein the polymeric material is polyurethane,  
wherein the slip agent is polytetraflourethylene and wherein at least 2% by weight of the  
impregnated polymer is polytetraflourethylene.

9. The drum of Claim 8 wherein no greater than 5% by weight of the  
impregnated polymer along the surface is polytetraflourethylene.

10. The drum of Claim 1 wherein the polytetraflourethylene is about 2% by  
weight of the impregnated polymer along the surface.

11. The drum of Claim 1 wherein the polymer is polyurethane and wherein the  
slip agent is a polyalpha olefin.

12. The drum of Claim 11 wherein no greater than 5% of weight of the  
impregnated polymer is the polyalpha olefin.

13. The drum of Claim 12 wherein at least 2% by weight of the impregnated  
polymer is the polyalpha olefin.

1           14.    The drum of Claim 11 wherein at least 2% by weight of the impregnated  
2 polymer is the polyalpha olefin.

1           15.    The drum of Claim 11 wherein the polyalpha olefin comprises about 3% by  
2 weight of the impregnated polymer along the surface.

1           16.    The drum of Claim 1 wherein the slip agent is configured so as to not  
2 substantially migrate within the polymer.

1           17.    The drum of Claim 1 including:  
2                   an inner layer including the impregnated polymer along the inner surface;  
3 and  
4                   an outer layer providing an exterior surface of the drum.

1           18.    The drum of Claim 17 wherein the outer layer is non-metallic.

1           19.    The drum of Claim 18 wherein the outer layer includes fiberglass.

1           20.    The drum of Claim 19 wherein the outer layer includes:  
2                   fiberglass windings about the inner layer;  
3                   a first layer of chopper fiberglass over the windings, the first layer having a  
4 ground surface with pores; and  
5                   a second layer of chopper fiberglass over the first layer and across the pores.

1           21.    The drum of Claim 20 wherein the first layer has a first thickness and  
2 wherein the second layer has a second lesser thickness.

1           22.    The drum of Claim 20 wherein the first layer has a thickness of about 0.25  
2 inch and wherein the second layer has a thickness of about 0.05 inch.

1           23.    The drum of Claim 20 wherein the second layer has a thickness of about 0.1  
2 inch.

1           24.    The drum of Claim 20 wherein the ground surface has a smoothness from  
2 being ground by a 16 grit abrasive.

1           25.    The drum of Claim 17 wherein the outer layer includes:

2 fiberglass windings about the inner layers;  
3 a sacrificial layer over the windings, wherein the sacrificial layer has a  
4 surface having pores; and  
5 a top layer over the sacrificial layer and across the pores.

1 26. The drum of Claim 17 wherein the outer layer is metallic.

1 27. The drum of Claim 1 wherein the impregnated polymer has a tensile strength  
2 of at least 15 MPa.

1 28. The drum of Claim 1 wherein the impregnated polymer has a Modulus 300%  
2 of at least 12 MPa.

1 29. The drum of Claim 1 wherein the impregnated polymer has a tear strength of  
2 at least 68 kN/m.

1 30. The drum of Claim 1 including inwardly extending projections configured to  
2 move material as the drum is rotated, wherein the projections partially provide the interior  
3 surface of the drum.

1 31. The drum of Claim 30 wherein the projections have an exterior surface  
2 including the impregnated polymer.

1 32. The drum of Claim 31 wherein at least a portion of one of the projections has  
2 a thickness completely formed from the impregnated polymer.

- 1           33.    A fin for use in a concrete mixing drum, the fin comprising:  
2                    an exterior surface at least partially provided by a polymer impregnated with  
3 a slip agent.
- 1           34.    A drum barrel for a concrete mixing drum, the barrel comprising:  
2                    an interior surface at least partially provided by a polymer impregnated with  
3 a slip agent.
- 1           35.    A method for forming a concrete mixing drum, the method comprising:  
2                    impregnating a polymer with a slip agent; and  
3                    forming an interior surface of a concrete mixing drum with the impregnated  
4 polymer.
- 1           36.    The method of Claim 35 including molding the impregnated polymer.
- 1           37.    The method of Claim 35 including spraying the impregnated polymer.
- 1           38.    The method of Claim 35 wherein the slip agent includes  
2 polytetrafluorethylene.
- 1           39.    The method of Claim 37 wherein impregnating includes mixing  
2 polytetrafluorethylene powder with a polyol.
- 1           40.    The method of Claim 39 wherein mixing comprises high sheer mixing.
- 1           41.    The method of Claim 40 wherein mixing is performed using a Cowles blade  
2 mixer.
- 1           42.    The method of Claim 35 including:  
2                    molding the impregnated polymer into a first section;  
3                    forming an interior of the drum with the section; and  
4                    applying fiberglass to an exterior of the first section.
- 1           43.    The method of Claim 42 including:  
2                    molding the impregnated polymer into a second section;  
3                    coupling the second section to the first section to form the interior of the  
4 drum; and

5                   applying fiberglass windings to an exterior of the second section.

1           44.     The method of Claim 43 wherein the first section and the second section are  
2     helical and wherein coupling includes screwing the first section and the second section  
3     together.

1           45.     The method of Claim 43 including:  
2                   applying a sacrificial layer of fiberglass over the windings;  
3                   grinding the sacrificial layer to form a ground exterior surface having pores;  
4     and  
5                   applying a top layer of fiberglass over the ground exterior surface.

1           46.     A method for finishing an exterior of a concrete mixing drum having a  
2     preliminary exterior surface, the method comprising:  
3                   applying a sacrificial layer of fiberglass over the preliminary exterior  
4     surface;  
5                   grinding the sacrificial layer to form a ground surface having pores; and  
6                   applying a top layer on the ground surface over the pores.

1           47.     The method of Claim 46 wherein the sacrificial layer is ground using an  
2     abrasive having at least a 16 grit.

1           48.     The method of Claim 46 wherein the top layer is chopper fiberglass.

1           49.     The method of Claim 48 wherein the top layer has a thickness of less than  
2     0.50 inches.

- 1           50.    A concrete mixing truck comprising:  
2                   a chassis;  
3                   a cab supported by the chassis;  
4                   a drum supported by the chassis and extending over the cab, the drum having  
5 the first section extending in an archimedial spiral along an axial center line of the drum;  
6 and  
7                   a second section extending in an archimedial spiral along the axial center line  
8 of the drum, wherein the first section and the second section extend adjacent to one another.
- 1           51.    A concrete mixing drum comprising:  
2                   a barrel having an inner surface and an outer surface; and  
3                   at least one projection spirally extending along the inner surface, wherein the  
4 inner surface is provided by a polymer and wherein the outer surface has a convex portion  
5 and a concave portion.
- 1           52.    The drum of Claim 51 wherein the concave portion is located along an axial  
2 midsection of the drum.
- 1           53.    The drum of Claim 51 wherein the convex portion and the concave portion  
2 are integrally formed as a single unitary body.
- 1           54.    The drum of Claim 53 wherein the convex portion and the concave portion  
2 are formed from fiberglass windings.
- 1           55.    The drum of Claim 51 wherein the inner surface is at least partially provided  
2 by a first archimedial section.
- 1           56.    The drum of Claim 51 wherein the projections are integrally formed as a  
2 single unitary body with the inner surface of the barrel.
- 1           57.    The drum of Claim 55 wherein the inner surface is provided by a second  
2 archimedial section screwed about the first section, wherein the first section and the second  
3 section each have an exterior mid-portion concave surface.

- 1           58.     A rotary concrete mixing drum comprising an interior surface at partially
- 2     provided by a material including one of a slip agent or strength-durability agent
- 3     impregnated within the other of the slip agent or strength/durability agent.